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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/770,725 | 01/26/2001 | Li Yang | 791_130 | 6015 |

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| EXAMINER |
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CREPEAU, JONATHAN

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| ART UNIT | PAPER NUMBER |
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1745

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DATE MAILED: 12/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/770,725

Applicant(s)

YANG ET AL.

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7. 6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1-16. The claims remain rejected under 35 USC §102 and §103 for substantially the reasons of record. Accordingly, this action is made final.

Specification

2. The disclosure is objected to because of the following informalities: in the amendment filed on September 30, 2002, several portions of the specification were replaced with replacement portions. However, some of these replacement portions contain lines of text which are illegible and could cause printing problems. As an example, the last line of page 28 of the amendment recites the text "theassemblyoftherespectivebatteriesandthereiseliminated." This spacing problem occurs in several other lines in replacement portions throughout the amendment. Resubmission of all replacement portions, with the right justification formatting removed, is suggested. If the replacement portions are otherwise identical to those in the amendment of September 30, 2002, no marked-up copy is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 12, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Watanabe et al (U.S. Patent 6,083,644). Regarding claim 1, the reference is directed to a nonaqueous lithium secondary battery comprising a positive and negative electrode laminated through a separator (see abstract and Figure 1). Regarding claims 1 and 2, the battery contains an electrolyte comprising lithium hexafluorophosphate (see col. 12, line 46). Regarding claim 1, as disclosed in column 14, lines 48-52, the positive electrode mixture and the negative electrode mixture both have moisture contents of 50 ppm or less. Therefore, the moisture content of both electrodes would inherently be lower than 5,000 ppm in case of heating the electrodes at 25 to 200°C, and lower than 1,500 ppm in case of heating at 200°C to 300°C, as recited in claim 1. Regarding claims 12 and 13, which recite that the battery is used in an electric automobile, these claims do not have to be accorded patentable weight because they recite an intended use and do not further limit the structure of the battery (MPEP §2114).

Thus, the instant claims are anticipated.

Claim Rejections - 35 USC § 103

5. Claims 3, 4, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al in view of Takami et al (U.S. Patent 6,350,544).

Watanabe et al. is applied to claims 1, 2, 12, and 13 for the reasons stated above.

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Watanabe et al. do not expressly teach that the positive electrode material is a lithium manganese oxide having a cubic spinel structure (e.g., LiMn_2O_4).

In column 4, lines 48 and 49, Takami et al. teach a lithium battery comprising a positive electrode material comprising LiMn_2O_4 .

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Takami et al. would motivate the artisan to use LiMn_2O_4 as the positive electrode material of Watanabe et al. In the cited passage, Takami et al. teach that LiMn_2O_4 is "preferable in view of obtaining a high voltage." Accordingly, the artisan would be motivated to use LiMn_2O_4 as the positive electrode material of Watanabe et al.

Regarding claims 14 and 15, these claims are not accorded patentable weight for the reasons set forth above.

6. Claims 5-7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. in view of Takami et al. as applied to claims 3, 4, 14, and 15 above, and further in view of Omaru et al (U.S. Patent 6,277,522).

Watanabe et al. do not expressly teach that the negative electrode active material is a graphitized carbon fiber.

In column 8, lines 13-21, Omaru et al. teach a negative electrode comprising a graphitized carbon fiber.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Omaru et al. would motivate the artisan to use graphitized carbon fiber as the negative electrode material of Watanabe et al. In the cited passage, Takami et al. teach that graphitized fiber can be realized which has "strength tolerable to expansion/contraction at the time of charge/discharge and high capacity." Accordingly, the artisan would be motivated to use graphitized carbon fiber as the negative electrode material of Watanabe et al.

7. Claims 1-4 and 8-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al (U.S. Patent 6,235,426) in view of Watanabe et al., in further view of Takami et al.

Regarding claim 1, Yanai et al. is directed to a nonaqueous lithium secondary battery comprising a positive and negative electrode laminated through a separator (see abstract and Figure 1). Regarding claims 1 and 2, the battery contains an electrolyte comprising lithium hexafluorophosphate (see col. 8, line 42). Regarding claims 8-11, the battery has a capacity of 3.5 Ah (see Table 1).

Yanai et al. do not expressly teach the water content of each electrode (as recited in claim 1), or that the positive electrode material is a lithium manganese oxide having a cubic spinel structure (e.g., LiMn_2O_4) (claims 3, 4).

As set forth above, in column 4, lines 48 and 49, Takami et al. teach a lithium battery comprising a positive electrode material comprising LiMn_2O_4 .

As set forth above, Watanabe et al. teach in column 14, lines 48-52 that the positive electrode mixture and the negative electrode mixture both have moisture contents of 50 ppm or less.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Takami et al. would motivate the artisan to use LiMn_2O_4 as the positive electrode material of Yanai et al. In the cited passage, Takami et al. teach that LiMn_2O_4 is “preferable in view of obtaining a high voltage.” Accordingly, the artisan would be motivated to use LiMn_2O_4 as the positive electrode material of Yanai et al.

Furthermore, the disclosure of Watanabe et al. would motivate the artisan to use electrodes having a moisture content of less than 50 ppm in the battery of Yanai et al. In column 14, line 49 et seq., Watanabe et al. teach that it is “preferred...from the point of cycle property” that the electrodes have such a low moisture content. Additionally, the combined moisture content of the electrodes would inherently be lower than 5,000 ppm in case of heating the electrodes at 25 to 200°C, and lower than 1,500 ppm in case of heating at 200°C to 300°C, as recited in claim 1.

Regarding claims 12-15, these claims are not accorded patentable weight for the reasons set forth above.

Response to Arguments

8. Applicant's arguments filed September 30, 2002 have been fully considered but they are not persuasive. Applicants assert that "none of such disclosure in Watanabe '644 would inherently satisfy the features recited in claim 1 of the present application, because such analysis does not consider the presence water in the electrolyte." In response, it is submitted that the amount of water in the electrolyte of Watanabe is not germane to the claimed invention, which is only concerned with the water content of both electrodes. Furthermore, it is still believed that the disclosure of Watanabe would inherently meet the claimed limitations concerning the water content in the electrodes. It is acknowledged that the disclosure of Watanabe, in the relevant portion, is somewhat ambiguous. The relevant portion (col. 14, line 48 et seq.) is reproduced as follows:

The moisture content is preferably 2,000 ppm or less as the entire battery, and it is preferred for the positive electrode mixture, the negative electrode mixture or the electrolyte to be 50 ppm or less from the point of cycle property.

In the application of the Watanabe reference in the rejections above, this passage was interpreted as disclosing that *each one* of the positive electrode mixture, negative electrode mixture, and electrolyte has a water content of 50 ppm or less. However, the passage could also be interpreted as requiring that the *total* water content of the positive mixture, negative mixture, and electrolyte combined is less than 50 ppm. In the first interpretation, the water content of the electrodes would at no time exceed 100 ppm. In the second interpretation, the water content of the electrodes would at no time exceed 50 ppm. Therefore, it is submitted that, given either interpretation, the combined water content of the electrode mixtures of Watanabe would *always* fall within Applicant's claimed ranges. If the electrode mixtures of Watanabe contained water at

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a concentration of 100 ppm or less at all times, consistent with the first interpretation, then the electrodes would inherently release only up to 100 ppm upon heating. The electrodes cannot release more water than they initially contain. Therefore, it is submitted that the electrodes would always release less than 5,000 or 1,500 ppm as claimed by the Applicants, regardless of the temperature the electrodes were subjected to. Accordingly, Applicant's argument that "it is not possible to extrapolate the water contents defined in the present invention from the values given in Watanabe '644 because Watanabe '644 is silent as to the temperature at which moisture content is determined" is not persuasive. As noted above, the electrodes of Watanabe contain a specific maximum amount of water (e.g., 100 ppm) *at all times* and *at all temperatures*, which maximum amount falls within Applicant's claimed ranges.

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (703) 308-2383. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 305-5408 or (703) 305-5433.

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700

JSC

December 4, 2002